4.2 HYDROLOGY, FLOODPLAINS, AND WATER QUALITY

This section includes discussions of impacts and mitigation measures related to hydrology and floodplains in the study area and focuses primarily on the identified Preferred Alternative (PA). The floodplain information contained in this section is based on the *SR-22 West Orange County Connection (SR-22/WOCC) Floodplain Evaluation Report* and the *Floodplain Evaluation Report Reduced Build Alternative Addendum* (December 2000), both of which are available under separate cover at the Department and OCTA. The referenced documents provide floodplain analyses of surface water features of the SR-22/WOCC proposed project.

The discussions in this section were the result of refined engineering, responding to comments received during the public comment period for the August 2001 DEIR/EIS, and/or additional planning efforts. As discussed in Section 2.2-1, the added limits to the (Enhanced) Reduced Build Alternative would not contribute to any new environmental impacts. Potential environmental impacts from this added portion have been previously analyzed as part of the Full Build Alternative (SR-22/SR-55 HOV connector) and determined not to be substantial to hydrology, floodplains, and water quality. The refinement to the right-of-way and the modification to the Pearce Street pedestrian overcrossing would have no effects to hydrology, floodplains, and water quality. The comments and responses to comments are attached as Appendix A of this FEIS/EIR (volumes II & III).

4.2.1 SURFACE WATER

A. PREFERRED ALTERNATIVE/(ENHANCED) REDUCED BUILD ALTERNATIVE

Use. The major surface water resources in the project area for the (Enhanced) Reduced Build Alternative are the Santa Ana River, Santiago Creek, and San Gabriel River. These surface water bodies receive runoff, either directly or indirectly, from the pavement surfaces of SR-22 and project area impervious surfaces. The surface area of pavement on a roadway is one determinant of the amount of runoff that would be discharged into receiving waters. The (Enhanced) Reduced Build Alternative would increase the amount of paved surface area by approximately 10 hectares (25 acres), or 4.7 percent of the entire SR-22 WOCC. The quantity of runoff entering the Santa Ana River, the Santiago Creek, and various storm drain channels within the study area would be minimally increased. The increase in surface water runoff would not affect current beneficial uses of the two water bodies. For a complete list of beneficial uses for the Santa Ana River and the Santiago Creek, refer to 1995 Basin Plan for the Regional Water Quality Control Board Region 9, Santa Ana at http://www.swrcb.ca.gov/rwqcb8/

Runoff from the project area does not directly discharge into the San Gabriel River but rather into the Los Alamitos Channel, which contains wetland vegetation further downstream. An increase in runoff from the roadway due to the increase in paved area may minimally affect wetlands near the Los Alamitos Channel. For further information on wetlands refer to Section 4.4, Wetlands, of this document.

Quality. Currently, the majority of runoff flows into lined channels throughout the project area. The only surface waters that support any vegetation within or downstream from the study area are the Los Alamitos Channel, Santiago Creek and the Santa Ana River. Runoff from the roadway would be the most likely source of contamination to surface waters. Typical highway runoff may include vehicle-related pollutants such as oil, grease, and other petroleum products. Other pollutants that may also affect the watershed include illicit dumping, litter, and pollutants from pesticides, herbicides, and fertilizers (California Department of Transportation, 2001). Existing vegetation and wildlife in the Los Alamitos Channel, Santiago Creek and the Santa Ana River are adapted to the current water conditions. The incremental increase in contaminants would not be expected to result in the loss of this adapted vegetation and wildlife. Further discussion of impacts to biological resources in the Los Alamitos Channel, the Santiago Creek, and the Santa Ana River may be found in Section 4.3, Biology.

As discussed in Section 3.2.1 C, runoff from the study area does not discharge directly into any 303(d) listed water bodies. However, runoff from the study area may discharge indirectly into 303(d) listed water bodies located further downstream. The increase in runoff from impervious surfaces would minimally impact these water bodies because of the indirect nature of the discharge and the distance the runoff must travel before reaching these water bodies. Further, the components of typical highway runoff are not the same pollutants and stressors for which those water bodies are listed.

In accordance with the Department's National Pollution Discharge Elimination System (NPDES) permit, to minimize impacts to surface waters, a Storm Water Pollution Prevention Plan (SWPPP) would be developed for the proposed project, and submitted to the RWQCB and the Department for approval. The SWPPP would address storm water and non-storm water runoff and would outline construction Best Management Practices (BMPs). In addition, permanent BMPs would be selected during the design process. The selected BMPs would reduce runoff pollutant levels and minimize impacts to water quality. Refer to Section 4.2.4 for further information regarding water quality management.

B. OTHER ALTERNATIVES

1. NO BUILD ALTERNATIVE

The No Build Alternative would not include construction other than that addressed in previous environmental documents for approved projects. No new impacts to surface water availability, use or quality would occur.

2. TSM/EXPANDED BUS SERVICE ALTERNATIVE

The TSM/Expanded Bus Service Alternative would include operational improvements and would not include any major capital improvements to SR-22. It would not result in substantial impacts to surface water availability, use or quality.

3. FULL BUILD ALTERNATIVE

Use. See discussion for the identified Preferred Alternative, above. The Full Build Alternative would yield an increase in paved surface of 24 hectares (60 acres), or approximately 11 percent of the entire SR-22 WOCC.

Thresholds of Significance for CEQA:

- Potential storm water and surface water pollution from construction and operation, substantially impairing the quality of the water.

CEQA Findings:

A. PREFERRED ALTERNATIVE/(ENHANCED) REDUCED BUILD ALTERNATIVE

Use. Since the (Enhanced) Reduced Build Alternative would increase the amount of paved surface area by approximately 10 hectares (25 acres), a slight increase in the amount of runoff may enter the Santa Ana River and other surface waters. The minimal increase in runoff would not impact the use of existing water resources.

Quality. Runoff from the roadway would be the most likely source of contamination to surface waters. The majority of runoff flows into lined channels. The only surface waters that support any vegetation within or downstream from the study area for this Alternative are Los Alamitos Channel, Santiago Creek and the Santa Ana River. These areas currently receive highway and roadway runoff, and existing vegetation is adapted to the water quality conditions. The

incremental increase in contaminants would not be expected to result in the loss of this adapted vegetation.

Increase in vehicle-related pollutants is not expected to impact surface water quality downstream. The increase in runoff from impervious surfaces would minimally impact 303(d) listed water bodies located further downstream because of the indirect nature of the discharge and the distance the runoff must travel before reaching those water bodies. In addition, the components of typical highway runoff are not the same pollutants and stressors for which those water bodies are listed under Section 303(d).

In accordance with the Department's National Pollution Discharge Elimination System (NPDES) permit, to minimize impacts to surface waters, a Storm Water Pollution Prevention Plan (SWPPP) would be developed by the contractor for the proposed project, and submitted to the Department for approval. The SWPPP would address storm water and non-storm water runoff and would outline construction Best Management Practices (BMPs). In addition, permanent BMPs would be selected during the design process. The selected BMPs would reduce runoff pollutant levels to less than significant levels. Refer to Section 4.2.4 for further information regarding water quality management.

B. OTHER ALTERNATIVES

1. NO BUILD ALTERNATIVE

No new impacts to surface water availability, use or quality would occur.

2. TSM/EXPANDED BUS SERVICE ALTERNATIVE

There would be no impacts to surface water availability, use or quality.

3. FULL BUILD ALTERNATIVE

See the discussion for the identified Preferred Alternative, above. The amount of paved area resulting from the Full Build Alternative is 24 hectares (60 acres).

4.2.2 GROUNDWATER

A. PREFERRED ALTERNATIVE/(ENHANCED) REDUCED BUILD ALTERNATIVE

Availability. The (Enhanced) Reduced Build Alternative would add approximately 10 hectares (25 acres) of pavement to the roadway. Because additional surface areas would be covered with impermeable surfaces, there would be a minimal decrease in natural groundwater recharge. However, the majority of groundwater recharge in the study area occurs by artificial recharge from water within the Santa Ana River. Thus, no impact would occur to the availability of water used for recharge within the river.

Use. Groundwater in the area is used for municipal and domestic supply, agricultural supply, industrial service supply and industrial process supply. Improvements included in the (Enhanced) Reduced Build Alternative would not affect the use of any groundwater wells.

Quality. Runoff from the roadway may result in increased contamination entering the groundwater from percolation of surface waters. Receiving groundwater is susceptible to the types of contamination described in Section 4.2.1, Surface Water. The (Enhanced) Reduced Build Alternative may incrementally add to highway runoff due to the increase in paved surface areas.

Only a small portion of the runoff flows into the Santa Ana River. The small increase in runoff volume that flows into the Santa Ana River in areas used for groundwater recharge would incrementally affect groundwater quality, but the changes are not expected to affect its beneficial uses. For a list of beneficial groundwater uses in the project area, refer to the 1995 Basin Plan for the Regional Water Quality Control Board Region 9, Santa Ana at http://www.swrcb.ca.gov/rwqcb8/

B. OTHER ALTERNATIVES

1. NO BUILD ALTERNATIVE

The No Build Alternative would not include construction other than that addressed in previous environmental documentation for approved projects. No new impacts to groundwater availability, use or quality would occur.

2. TSM/EXPANDED BUS SERVICE ALTERNATIVE

Impacts to the availability, use or quality of groundwater would be minimal.

3. FULL BUILD ALTERNATIVE

The Full Build Alternative would include widening of the portion of the roadway that passes over the Santa Ana River. The availability of water for groundwater recharge in the river would be unaffected because areas above the river would drain into it. Since only a small portion of the runoff drains into the Santa Ana River, the impacts to groundwater quality and use would be minimal. There would be a slight decrease in groundwater recharge from the 24 hectares (60 acres) of additional paved surface. However, this amount is not expected to affect the availability, use, and quality of groundwater in the project vicinity because there is minimal percolation occurring within these areas.

Thresholds of Significance for CEQA:

- Substantial impacts on groundwater availability, use or quality.

CEQA Findings:

A. PREFERRED ALTERNATIVE/(ENHANCED) REDUCED BUILD ALTERNATIVE

Availability. The (Enhanced) Reduced Build Alternative would add approximately 10 hectares (25 acres) of pavement to the roadway, causing a slight decrease in groundwater recharge. This would result in less than significant impact to the availability of water.

Use. Improvements included in the (Enhanced) Reduced Build Alternative would not affect any groundwater wells. Therefore, current uses of groundwater in the area would be minimally affected.

Quality. The (Enhanced) Reduced Build Alternative may incrementally add to highway runoff due to the increase in paved surfaces. This incremental increase in runoff would result in less than significant impacts if temporary and permanent Best Management Practices are implemented.

Only a small portion of the runoff flows into the Santa Ana River. Surface water quality in the river is important because it is used for groundwater recharge. However, most of the recharge basins are located north (upstream) of the proposed improvements, and few sites are located downstream.

B. OTHER ALTERNATIVES

1. NO BUILD ALTERNATIVE

The No Build Alternative would have no impacts to groundwater availability, use or quality.

2. TSM/EXPANDED BUS SERVICE ALTERNATIVE

The TSM/Expanded Bus Service Alternative would result in no impacts to the availability, use or quality of groundwater.

3. FULL BUILD ALTERNATIVE

The Full Build Alternative would include widening of the portion of the roadway that passes over the Santa Ana River. The availability of water for groundwater recharge in the river would be unaffected because areas above the river would drain into it. Since only a small portion of the runoff drains into the Santa Ana River, the impacts to groundwater quality and use would be minimal. There would be a slight decrease in groundwater recharge from the 24 hectares (60 acres) of additional paved surface. However, this amount is not expected to affect the availability, use, and quality of groundwater in the project vicinity because there is minimal percolation occurring within these areas.

4.2.3 FLOODPLAIN

A. PREFERRED ALTERNATIVE/(ENHANCED) REDUCED BUILD ALTERNATIVE

Changes in Floodplain Elevations. There are eight waterways within the study area floodplain that were studied for the (Enhanced) Reduced Build Alternative. Table 4.2-1 describes the impacts for most of the waterways.

As part of this project, county facilities, including culverts, incapable of carrying 100-year floods upstream and downstream of SR-22 would be upgraded within project limits. Should the project have an impact on any cross culvert, the Department would contact Orange County Flood Control District (OCFCD) to obtain a permit to improve the facility.

Changes in Floodplain Risks. The (Enhanced) Reduced Build Alternative would not result in significant floodplain risks as defined by FEMA. It would not be a significant longitudinal encroachment. There would be minimal risks associated with the action; the action would not support probable incompatible floodplain development. The action would be minimal on floodplain encroachment. Non-routine measures would not be required to minimize floodplain impacts associated with the action. There would be minimal impacts on natural and beneficial floodplain values. Non-routine measures would not be required to restore and preserve the natural and beneficial floodplain values impacted by the action for the (Enhanced) Reduced Build Alternative.

Table 4.2-1
CHANGES IN FLOODPLAINS
(ENHANCED) REDUCED BUILD ALTERNATIVE

Waterway	Impact
Los Alamitos Channel (C01)	Improvements are not anticipated to impact the flow or flood storage area of the channel. The toe of the widened highway embankment would be above the maximum flooding elevation.
Montecito Storm Channel (C01S03)	Improvements are not anticipated to impact the floodplain of the Montecito Storm Channel. The embankment would require a lengthening of the existing culvert under the embankment with minimal hydraulic impacts.
Bixby Storm Channel (C01S04)	Improvements are not anticipated to impact the floodplain of the channel. The 100-year flow of this segment of the storm channel is relatively small. The proposed relocation of the Seal Beach Boulevard northbound on-ramp in this area would require the relocation of the channel, replacement of the channel with a culvert or construction of a retaining wall to maintain flow capacity, with no negative impact to the channel.
Federal Storm Channel (C01S06)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing culvert under the embankment with minimal hydraulic impacts.
Bolsa Chica Channel (C02)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing culvert under the embankment with minimal hydraulic impacts.
Anaheim-Barber City Channel (C03)	Improvements are not anticipated to impact the floodplain of the channel. The embankment or bridge widening would not require a lengthening of the existing culvert that passes under both SR-22 and Knott Street/Goldenwest Street.
East Garden Grove-Wintersburg Channel (C05)	Improvements are not anticipated to impact the floodplain of the channel. The embankment would require a lengthening of the existing culvert under the embankment with minimal hydraulic impacts.
Santiago Creek (E08)	Improvements at both the SR-22 and SR-55 crossing are not anticipated to impact the floodplain of the creek. Both bridge widenings would require additional piers to be placed in the creek. By placing the piers in the same alignment as the existing bridge piers, the hydraulic impacts to Santiago Creek should be minimal.

B. OTHER ALTERNATIVES

1. NO BUILD ALTERNATIVE

The No Build Alternative would not include construction other than that addressed in previous environmental documents for approved projects. No new impacts to floodplain elevations would occur. No new risks associated with flooding would occur.

2. TSM/EXPANDED BUS SERVICE ALTERNATIVE

The TSM/Expanded Bus Service Alternative would include operational improvements to bus service and would not include any major capital improvements to SR-22. No new impacts to floodplain elevations are expected. New risks associated with flooding are expected to be negligible.

3. FULL BUILD ALTERNATIVE

Changes in Floodplain Elevations. There are eight waterways within the proposed project area that were studied for the Full Build Alternative. The Full Build Alternative would include widening of the portion of the roadway that passes over the Santa Ana River. However, this improvement would not contribute any additional impact than those previously discussed in the August 2001 DEIR/EIS.

Changes in Floodplain Risks. The Full Build Alternative would not result in significant floodplain risks as defined by FEMA. It would not be a significant longitudinal encroachment. There would be no significant risks associated with the action. The action would not support probable incompatible floodplain development. The action would not be a significant floodplain encroachment. Non-routine measures would not be required to minimize floodplain impacts associated with the action. There would be no significant impacts on natural and beneficial floodplain values. Non-routine measures would not be required to restore and preserve the natural and beneficial floodplain values impacted by the action for the Full Build Alternative.

Thresholds of Significance for CEQA:

- Potential of new/enlarged structures, including culverts, that may result in change in floodplain elevation

CEQA Findings:

A. PREFERRED ALTERNATIVE/(ENHANCED) REDUCED BUILD ALTERNATIVE

The (Enhanced) Reduced Build Alternative would result in less than significant floodplain impacts as defined by FEMA. There would be less than significant impacts on natural and beneficial floodplain values. No changes in floodplain limits are anticipated because the floodplain is contained within the channel at this location.

B. OTHER ALTERNATIVES

1. NO BUILD ALTERNATIVE

The No Build Alternative would have no impacts to floodplain elevations or increased flooding.

2. TSM/EXPANDED BUS SERVICE ALTERNATIVE

No impacts to floodplain elevations would occur and new risks associated with flooding would not occur.

3. FULL BUILD ALTERNATIVE

Changes in Floodplain Elevations. See Table 4.2-1 above for description of impacts to most of the waterways.

4.2.4 MITIGATION

A. PREFERRED ALTERNATIVE/(ENHANCED) REDUCED BUILD ALTERNATIVE

See Section 4.4, Wetlands, of this document for erosion control mitigation.

HYD-(E)RB-1: For all bridges and other structures to be built within 100-year floodplains, specific impacts to floodplain elevations will be analyzed at the design stage. Such structures will not be allowed to result in a 0.3-meter (one-foot) or greater impact in floodplain elevation. If analysis of the design indicates impacts equal to or greater than this threshold, the designs will be revised until the impact is reduced to less than the threshold.

HYD-(E)RB-2: The Department has obtained a Statewide National Pollutant Discharge Elimination System (NPDES) permit (the Permit). The Department will comply with all provisions of the Permit. As directed by the Permit, the Department implements the Statewide Stormwater

Management Plan (SWMP) that describes a framework for management of storm water discharges during the term of the Permit. The Contractor shall implement and maintain temporary (during construction) Best Management Practices (BMPs) and the Department will implement and maintain permanent (post construction) BMPs to control storm water and non-storm water discharges and to meet the discharge requirements of the Santa Ana Regional Water Quality Control Board (RWQCB). The Contractor shall fully conform to the requirements of the Permit, Order No. 99-06-DWQ, NPDES No. CAS000003. When applicable, the contractor shall also conform to the requirements of the General NPDES Permit for Construction Activities, Order No. 92-08-DWQ, NPDES No. CAS000002, and any subsequent revisions. In compliance with the Department's NPDES Permit, a Storm Water Pollution Prevention Plan (SWPPP) will be developed for the SR-22/WOCC proposed project, and submitted for approval prior to construction. The SWPPP would address construction storm water and non-storm water runoff.

HYD-(E)RB-3: The Department's Storm Water Management Plan also encompasses design and operation/maintenance measures to address operation of the Department's facilities. Appropriate permanent Best Management Practices (BMPs), such as dry weather flow diversion, biofiltration strips/swales, infiltration basins, and detention devices, will be selected and approved by the Department during the design process. Routine maintenance will be conducted to ensure the selected BMPs are effective in reducing runoff pollutant levels to insignificant levels.

HYD-(E)RB-4: Coordination with the Regional Board and the Department during the design process would be used to select the appropriate permanent BMPs for the proposed improvements.

Design, construction, and operation/maintenance activities all contribute to the overall effort of minimizing water pollution. For further discussion regarding the Department's storm water program, please refer to the Department's Statewide Storm Water Management Plan (SWMP, 2001).

B. OTHER ALTERNATIVES

1. NO BUILD ALTERNATIVE

   None proposed

2. TSM/EXPANDED BUS SERVICE ALTERNATIVE

   None proposed.

3. FULL BUILD ALTERNATIVE

   Same Mitigations as those listed for the identified "Preferred Alternative" above.

4.2.5 RESIDUAL IMPACTS AFTER MITIGATION

A. IDENTIFIED PA/(ENHANCED) REDUCED BUILD ALTERNATIVE

Less than substantial.

B. OTHER ALTERNATIVES

1. NO BUILD ALTERNATIVE

None.

2. TSM/EXPANDED BUS SERVICE ALTERNATIVE

None.

3. FULL BUILD ALTERNATIVE

Less than substantial.

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